and a large number in Mindanao, the number of 7,451,352 gives no correct idea of the real population of the Philippines. This is not known at all, and will not be known for a long time to come.

The number of 7,451,352 is composed in the following manner :—

| | | | | |
|---|---|---|---|---|
| The Island of | Luzon | 4,467,111 | in 508 | villages |
| ,, ,, ,, | Panay | 1,052,586 | ,, 92 | ,, |
| ,, ,, ,, | Cebu | 427,356 | ,, 51 | ,, |
| ,, ,, ,, | Leyte | 285,495 | ,, 43 | ,, |
| ,, ,, ,, | Bohol | 283,515 | ,, 36 | ,, |
| ,, ,, ,, | Negros | 255,873 | ,, 43 | ,, |
| ,, ,, ,, | Samar | 250,062 | ,, 35 | ,, |
| ,, ,, ,, | Mindanao | 191,802 | ,, 64 | ,, |
| ,, ,, ,, | Mindoro | 70,926 | ,, 18 | ,, |

The remainder on the other small islands.

The following is the division into 43 provinces :—

| | | | |
|---|---|---|---|
| Abra | 37,266 | in 8 | villages |
| Albay | 341,493 | ,, 38 | ,, |
| Antique | 131,886 | ,, 19 | ,, |
| Basilan | 600 | ,, 1 | ,, |
| Bataan | 67,362 | ,, 12 | ,, |
| Batangas | 432,504 | ,, 21 | ,, |
| Bulacan | 346,317 | ,, 24 | ,, |
| Bohol | 283,515 | ,, 36 | ,, |
| Burias | 2,430 | ,, 1 | ,, |
| Cagayan | 114,396 | ,, 19 | ,, |
| Calamianes | 27,189 | ,, 5 | ,, |
| Camarines North | 42,525 | ,, 9 | ,, |
| ,, South | 434,016 | ,, 34 | ,, |
| Capiz | 272,292 | ,, 32 | ,, |
| Cavite | 173,193 | ,, 19 | ,, |
| Cebu | 427,356 | ,, 51 | ,, |
| Cottabato | 1,200 | ,, 1 | ,, |
| Davao | 1,860 | ,, 1 | ,, |
| Hoilo | 648,408 | ,, 41 | ,, |
| Hocos North | 220,038 | ,, 15 | ,, |
| ,, South | 265,233 | ,, 21 | ,, |
| Islas Batanes | 12,000 | ,, 6 | ,, |
| Isla de Negros | 255,873 | ,, 43 | ,, |
| Isabela | 47,067 | ,, 9 | ,, |
| Laguna | 216,435 | ,, 28 | ,, |
| Lepanto | 56,088 | ,, 81 | ,, |
| Leyte | 285,495 | ,, 43 | ,, |
| Manila | 354,348 | ,, 29 | ,, |
| Mashate y Ticao | 17,190 | ,, 9 | ,, |
| Mindoro | 70,926 | ,, 18 | ,, |
| Misamis | 100,398 | ,, 32 | ,, |
| Morong | 73,080 | ,, 12 | ,, |
| N. Ecija | 167,325 | ,, 23 | ,, |
| N. Vizcaya | 21,471 | ,, 6 | ,, |
| Pampauga | 300,567 | ,, 29 | ,, |
| Pangasinan | 431,691 | ,, 30 | ,, |
| Romblon | 34,137 | ,, 9 | ,, |
| Samar | 250,062 | ,, 35 | ,, |
| Surigas | 73,770 | ,, 28 | ,, |
| Tayabas | 155,280 | ,, 17 | ,, |
| Union | 133,452 | ,, 13 | ,, |
| Zambales | 109,044 | ,, 23 | ,, |
| Zamboauga | 14,574 | ,, 2 | ,, |
| | 7,451,352* | 933 | |

The following division of the Philippine Islands is proposed, but not yet introduced :—

18 Provinces in 3 divisions

1st division.—Manila, Hoilo, Cebu, Hocos, Cagayan.

2nd division.—Pangasinan, Pampauga, Laguna, Cavite, Batangas, Albay, N. Ecija.

3rd division.—Bulacan, Camarines, Capiz, Negros, Leyte, Marianas.

The Islands of Mindanao, Basilan, Tolo (Soolo), Samales, and Balabac, will have a special government.

ADOLF BERNHARD MEYER

Manila, April 15

* The Marianas Islands belong to the Government of the Philippines with 8,000 to 9,000 inhabitants.

## *MINERAL SPRING OF SHANA NEAR TREBIZOND*

THE mountainous and volcanic district, or, to speak more correctly, belt, which skirts the northern coast of Asia Minor, beginning from Amastri, one hundred and fifty miles east of the Bosphorus, up to the Georgian valley and the Russo-Caucasian frontier, abounds in mineral springs, varying as to temperature and constituents, but generally endowed with hygienic properties, which are, to a certain extent, known and appreciated by the natives of the land. But few of these springs have been made the subject of scientific examination and analysis ; so that the ingredients whence they derive their value, where not discernible to the unassisted senses, are in most cases matter of conjecture rather than of demonstration.

In one instance, however, that of a remarkable mineral source within this district, the obligingness of a resident Italian chemist, M. Marengo by name, has lately furnished me with some scientific data, not indeed as complete as might have been desired, yet enough for interesting information. These I will now give, accompanied by my own observations made during frequent visits to the locality in question.

About six miles east of Trebizond on the sea-coast stands the little fishing village of Covata, at the entrance of the valley which, as also the stream that flows down it, bears the same name. Following the valley some way inland towards the mountains where it originates, we come on the water-course and ravine of Shána, falling into that of Covata at nearly right angles, from east to west. "Shána" is, like most names of places hereabouts, a word of Laz, that is Mingrelian, origin, and signifies "heat." This ravine is narrow and deep ; the rocks on either side are volcanic, chiefly mottled tufa of dark grey substance, speckled throughout with small black fragments of irregular shape and size imbedded in it. Vegetation, wherever the steepness of the slope allows it to take root, is most luxuriant ; vines, olives, walnut trees, chesnut, sycamore, maple, poplar, with a dense undergrowth of alder and hazel. Down the bottom of the gorge flows a small torrent, which joins the river of Covata not far from its sea-mouth.

Tracking the narrow path which leads up to the Shána gorge for about four hundred yards, we come on a sort of widening-out, where a horizontal sheet of porous volcanic rocks spreads to some distance alongside of, but slightly elevated above, the course of the torrent. In the middle of this rock-sheet has been formed, partly by nature, partly by art, a small circular basin, nearly three feet in diameter, and averaging a foot or rather more in depth. This is constantly full of clear, limpid-looking water, which wells up through several irregular clefts in the stone bottom of the basin, and overflows it, the waste running off down the ledge into the neighbouring torrent, and leaving everywhere on its passage a thick bright-red deposit of oxide of iron, which stains the rocks, and even discolours the main-stream to some distance. Through the clefts just mentioned bubbles of carbonic acid gas rise in sufficient abundance to give the water the appearance of boiling ; but the temperature is normal. This water is strongly impregnated with free carbonic acid ; its taste is pungent and ferruginous, with a distinct, but, so long as it is fresh, a not unpleasant indication of sulphur. If it is put into a bottle, corked, and exposed to the heat of the sun, the expansion of the gas soon causes an explosion, driving out the cork, and even bursting the bottle.

Near this semi-artificial basin, and placed on a line with it one after another in the axis of the valley, are two other natural rock-hollows, one of several feet in extent, the other less ; whence the same description of ferruginous water, mixed with bubbles of carbonic acid gas,

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issues continually, but not in equal abundance, the fissures below being partially choked up, whereas those in the circular basin are carefully kept open by the peasants. Here, too, the rock around is stained with bright red streaks of iron deposit. Also, carefully observing the torrent itself, which flows in a parallel direction a few feet distant, I noticed that bubbles of gas kept rising here and there from between the stones in its bed, and that the water, though tasteless higher up, here partook to a certain extent of the mineral acidity so strongly marked in the springs.

The analysis of the ingredients of the "Shána" water, as supplied me by M. Marengo, was not quantitative, but merely qualitative. I give it as follows, apologising at the same time for any technical inexactitude in my translation from the letter of the Italian document now before me :—

INGREDIENTS

| | |
|---|---|
| Hydrosulphuric Acid . . . | Abundant |
| Carbonic Acid . . . . . | Abundant |
| Sulphuric Acid . . . . . | Not much |
| Chlorine . . . . . | Scanty |
| Oxide of Iron . . . . . | Very abundant |
| Lime . . . . . | Abundant |
| Magnesia . . . . . | Abundant |
| Alumina . . . . . | Scanty |
| Soda . . . . . | Scanty |
| Potash . . . . . | Trace |
| Silica . . . . . | Trace |

Iron, free carbonic acid, sulphur, and magnesia, are the chief characteristics of this spring.

Among the Mahometan and Turkish-speaking population of the neighbourhood, the source goes by the name of "'Ilijeh," or "Healing," a term which they apply to almost every mineral spring of whatever description. As for this one in particular, the natives ascribe to it almost every sanatory virtue that a Holloway's advertisement could claim. In reality it is tonic, and, if its use be persevered in, alterative ; the magnesia which it contains renders it at first slightly laxative. A considerable quantity of the water is brought in jars or bottles, which are filled and closed on the spot, to Trebizond, where it is much esteemed. The supply is unaffected by change of weather or season ; only in summer the water is a few degrees cooler, as in winter warmer, than that of the torrent close by, which is often, during the severity of a Black-Sea February, changed into ice ; whereas the little circular basin, in spite of its shallowness, never freezes.

The so-called "Greeks," who have a small peasant colony in the neighbourhood, have christened the source, in their modern corrupt dialect, "Iäsma," the correct word being Ἁγιασμα, or "sanctification," and have erected on an over-hanging rock close by, a small chapel, dedicated to I know not what saint, the supposed patron of the waters. The Turks, on the contrary, attach to it no religious idea whatever.

The peasants report the existence of another ferruginous spring some miles farther on among the mountains, ; but the precipitous character of the paths leading to it and the density of the forests, render it practically inaccessible to all but themselves.

Trebizond, May 28 W. GIFFORD PALGRAVE

## *THE DISPERSION OF SEEDS BY THE WIND*

IN the very interesting notice of Grisebach's "Vegetation der Erde," which appeared in a recent number of NATURE,* reference is made to a paper by Kerner of Innsbrück, "On the Influence of the Wind on the Distribution of Seeds in Mountain Regions." As this paper was presented to the German Alpine Club, and no translation, as far as I am aware, has appeared in this country, with the exception of an abstract in the *Gardener's Chronicle*, it is probably almost unknown to English readers, and a short epitome of its most interesting features may not be unacceptable.

The idea that the wind performs a very important part in the distribution of plants, by the extensive dispersion of their seeds, is a very prevalent one. Mr. Bentham has, however, pointed out in his Anniversary Address to the Linnean Society in 1869, that this popular belief rests on insufficient data. If that portion of thistle-down which has been carried to a considerable distance by a high wind is carefully observed, it will generally be found to have left its seed behind it ; and in the same order of Compositæ, several species of *Eclipta*, *Elephantopus*, *Anthemis*, and *Lapsana*, which have no pappus, have a much more wide-spread distribution than the majority of *Senecios*, for instance, with their light and broad pappus. The rapid spread of our common thistle, *Carduus arvensis*, in any new country where it once gains a foothold, is probably as much due to the persistent vitality of its roots as to the dispersion of its seeds. If the individuals in the same field are examined, they will generally be found to be all of one sex, showing that they must have been propagated by the division of the same individual. Of the extraordinarily rapid power of dispersion possessed by some plants independently of their seeds we have a familiar instance in the suddenness with which the Canadian water-weed, *Elodea canadensis*, filled up all our canals and water-courses within a few years of its first introduction ; and yet up to the present time the male plant is entirely unknown in this country, and indeed in Europe ; and it is probable that the whole of the stock now in England may have sprung by sub-division from the first imported specimen.

M. Kerner conceived the idea that a careful examination of the plants growing on moraines, and of the seeds found on the surface of glaciers, would throw considerable light on this interesting subject, since it is evident that they could only have arrived in those localities by the agency of the wind ; and the results of an elaborate series of investigations are recorded in the pamphlet alluded to. Firstly, with regard to the moraines :—A list of five of these floras, from as many different moraines, consisting of limestone, schist, and gneiss, included 124 species, the following orders being the most largely represented :—Compositæ, 23 per cent.; Caryophylleæ, 10 per cent.; Gramineæ, 8 per cent.; Mosses, Saxifrageæ, and Salicaceæ, 6 per cent.; Cruciferæ, 5 per cent.; Ferns and Rosaceæ, 4 per cent.; Scrophulariaceæ, 3 per cent. Of the smaller families, the genera *Valeriana*, *Epilobium*, and *Juncus*, occurred the most frequently. The investigation of these lists, with a view to trace the origin of the plants, shows that the larger number of those which constitute the moraine flora are species widely distributed over the higher mountain regions in immediate proximity to the glacier. Less frequent are those plants which belong to the grassy plateaux of the lower elevations ; and still less common species belonging to the meadow or wood flora of the lowlands, which maintain only a short and precarious existence.

The absence of this latter class of plants might, however, be due to the inability of the seeds to germinate under such unfavourable circumstances ; and in order to determine this point, M. Kerner carried his researches to the surface of the glacier itself, examining both the animal and vegetable productions found thereon, with the following results :—

The animals found were entirely dead or benumbed insects belonging to the orders Lepidoptera, Hymenoptera, Coleoptera, and Diptera, and consisted of forty-three species, a considerable portion of which are found only in the highest mountain regions in the immediate vicinity of the glaciers ; more than half the species were of very

* Vol. v. p. 458, April 11.

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